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ABSTRACT

Researchers have used children's self-reports to investigate the conditions under which children seek and give help. Little attention has been given to examining the predictive value of such measures, even though investigators in other domains have found discrepancies between self-reports and observed behavior. Two studies were conducted in which observations of 58 7th- and 8th-grade students and 96 9th- and 10th-grade students in Ontario (Canada), respectively, working in cooperative learning groups were compared with self-reported intentions to ask for and give help to peers. Both studies found that self-reports were poor predictors. The low correlations are attributed to student uncertainty about their competence on the task they were working on when observations were made, rather than to inadequacies of the survey instruments. Four tables present study information. (Author/SLD)

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Self-Reports

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Self-Reports and Observed Behavior

Seeking and Giving Help to Peers

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ABSTRACT

Researchers have used children's self-reports to investigate the conditions under which children seek and give help. Little attention has been given to examining the predictive validity of such measures, even though investigators in other domains have found discrepancies between self-reports and observed behavior. Two studies were conducted in which observations of grade 7-10 students working in cooperative learning groups were compared to self-reported intentions to ask for and give help to peers. Both studies found that self-reports were poor predictors. The low correlations were attributed to student uncertainty about their competence on the task they were working on when the observations were made, rather than to inadequacies of the survey instruments.

SELF-REPORTS AND OBSERVED BEHAVIOR SEEKING AND GIVING HELP TO PEERS¹

Research interest in help seeking as an adaptive mechanism enhancing student achievement (Corno & Mandinach, 1983; Nelson-Le Gall, 1985) and the mounting evidence of the effectiveness of peer-mediated instructional methods such as cooperative learning (Johnson, Maruyama, Johnson, Nelson & Skon, 1981; Slavin, 1990) have stimulated several lines of inquiry into student helpfulness. Although most research findings have been derived from observational studies, the capacity of self-report surveys to generate vast quantities of data from sizable samples at substantially lower cost makes this type of data collection technique attractive to investigators. But there has been little interest in examining the extent to which self-reports compare to observed behavior, despite findings from other domains that suggest that a one-to-one correspondence should not be assumed (D'Onofrio, 1989; Hook & Rosenshine, 1979; Wubbels, Brekelmans & Hoymayers, 1992). The purpose of this article is to investigate the extent to which action intentions, as measured with a self-report survey, correlate with observed behavior in two samples of middle school students in cooperative learning environments.

We will begin by reviewing findings from observational studies, summarizing the contribution of this line of research to our understanding of help seeking and help giving. We will then examine self-report studies on the same issues in order to identify findings which are comparable to the outcomes of observational research and to distinguish those results which are derived exclusively from self-report data. Studies which triangulate surveys with observations will also be reviewed.

Findings from Observational Studies

Much of the research on student helpfulness has involved simulations in lab settings. Several researchers have taken students out of class and given them a task that was designed to produce low performance in order to elicit help seeking. Broll, Gross and Piliavin (1974) gave a difficult logic problem to high school students and measured the number of times they asked for help in various conditions (e.g., with or without monetary incentives for correct answers). A similar strategy was used by Nadler and Porat (1978) with a concept identification task and by Wallston (1976) with an assignment that required subjects to detect neuroticism in a transcript of a conversation. Other lab studies of student help giving used simpler tasks such as identifying pieces of popular music (Morse, Gergen, Peele & van Ryneveld, 1977), proof reading text (Nemeth, 1970) and determining the meaning of words (Nelson-Le Gall, 1987; Nelson-Le Gall, DeCooke & Jones, 1989; Nelson-Le Gall & Jones, 1990; Nelson-Le Gall, Kratzer, Jones & DeCooke, 1990). Studies conducted in more naturalistic settings include observations of help giving during preschool play (Eisenberg-Berg & Hand, 1979), as well as observations in regular classrooms focusing on help seeking (Good, Slavings, Harel & Emerson, 1981), help giving (Saunders, 1989) or both (Webb, 1989). None of these studies attempted to correlate self-reports with observed behavior.

Observational studies have identified a series of factors that influence help seeking. Students are most likely to seek help when their performance is deficient (Ross & Raphael, 1990; Webb, 1984a,b; Webb & Kenderski, 1984) or is perceived to be incorrect (Nelson-Le Gall & Glor-Scheib, 1985; Nelson-Le Gall & Jones, 1990; Nelson-Le Gall et al., 1990). But many students do not seek help when they need it (Good et al., 1981; Markman, 1977) or ask for it when it is not required (Nelson-Le Gall et al., 1990). Unnecessary help seeking is particularly prevalent among lower ability and younger students (Nelson-Le Gall, 1987; Nelson-Le Gall & Glor-Scheib, 1986). Willingness to seek help appropriately increases with age (Deering & Meloth, 1990; Markman, 1977; Nelson-Le Gall et al., 1989; Nelson-Le Gall & Glor-Scheib, 1985; Nelson-Le Gall et al.,

1990) and specific competence (Webb, 1984b). High ability students are more persistent than others in seeking help (Nelson-Le Gall & Glor-Scheib, 1985) and intrinsically motivated students look for assistance that would enable them to figure things out for themselves (Nelson-Le Gall, 1990; Nelson-Le Gall & Jones, 1990). Females are more willing than males to seek help (Hacker, 1991; Nelson-Le Gall, et al., 1989) and there are complex interactions of sex with type of help requested and subject domain (Nelson-Le Gall & Glor-Scheib, 1985). There are more same-sex than cross-sex requests (Nelson-Le Gall & DeCooke, 1987). There is more help seeking when the social cost is reduced, for example, when aid seekers can remain anonymous, when they are told that most subjects require aid to complete the task (Nadler & Porat, 1978), or when help is offered without requiring a formal request (Broll et al., 1974).

Observational studies have also identified factors that influence help giving. For example, strategies used by help seekers influence the response. Help is more likely to be given if requests are direct, addressed to a specific individual, sincere and persistent (Cooper, Marquis & Ayers-Lopez, 1982; Webb, Ender & Lewis, 1986; Wilkinson & Calculator, 1982; Wilkinson & Spinelli, 1983). Providers of correct help tend to be of high ability (Lindlow, Wilkinson, & Peterson, 1985; Peterson & Janicki, 1979; Peterson, Johnson, & Johnson, 1991; Webb, 1984b; Webb et al. 1986) or at least of higher ability relative to other group members (Webb & Kenderski, 1984), even if the relative expertise is entirely bogus (Dembo & McAuliffe, 1987). The frequency of help giving can be increased by incentives (Broll et al., 1974) and through training (Swing & Peterson, 1982; Webb, Qi, Yan, Bushey & Farivar, 1990). Females are more willing than males to provide help (Nemeth, 1970; Webb, 1984b) and children are more willing to help familiars (deCooke & Nelson-Le Gall, 1989), particularly members of the same sex (Huston, Carpenter, Atwater, & Johnson, 1986; Nelson-Le Gall & DeCooke, 1987).

Findings From Self-Report Studies

Investigators have used student responses to hypothetical situations to infer attitudes toward seeking and giving help. Most used self-administered questionnaires or, usually in the case of younger children, employed interviews (e.g., Ladd et al., 1983; Nelson-Le Gall & Gumerman, 1984). The findings of these self-report inquiries tend to confirm the results of the observational studies regarding the greater frequency of help seeking among females (Aberbach & Lynch, 1991; dePaulo, 1979; Fischer & Turner, 1970; Northman, 1978), students' greater willingness to seek help from those like themselves (dePaulo, 1979; Ladd et al., 1983; Nelson-Le Gall & DeCooke 1987), the prevalence of unnecessary help seeking among younger students (Aberbach, Lynch & Eccles, 1991; Newman, 1990), the failure of lower ability students to seek help when it is required (Newman, 1990; Newman & Goldin, 1990) and the greater willingness to seek help when social costs are reduced (Amato & Saunders, 1985; Ladd et al., 1983).

Studies based on self-reports have also examined help seeking issues which have not been investigated in observational investigations. Amato and Saunders (1985) provided subjects with lists of typical episodes in which a university student might or might not seek help; students were more likely to report they would seek help in situations that were not serious and involved problems which were easily solved. This counter-intuitive finding was attributed to the positive correlation of seriousness with threats to self-esteem, a factor which diminished help seeking. Students were less likely to seek help with serious problems if doing so generated feelings of inadequacy. Amato & Saunders also reported that subjects were more likely to seek help if they believed that they would be able to reciprocate. Fischer and Turner (1970) found that secondary school students with high internal locus of control reported themselves to be more willing to seek professional help if they encountered a psychological problem. Karenbenick and Knapp (1988) found a curvilinear relationship between ability and asking for help; the highest levels of help seeking were in the middle achievement range. Students who needed help the most did not seek it because they attributed their failure to low ability, creating feelings of helplessness and failure.

Subjects. Two grade 7 and two grade 8 teachers, each located in a different school in a small city or rural area in east-central Ontario, volunteered for the project. Complete data sets were obtained from 58 students. Students were between 12 and 14 years of age; half were female. There were few visible minorities.

Instruments. Student interactions while in cooperative groups were video taped on a single occasion for 20-30 minutes near the end of the program. Verbatim transcripts of the tapes were made; the students who were recorded reviewed the transcripts while viewing the video tapes to identify speakers and correct the records of conversations.

A sample of student dialogue, consisting of 3 1/2 pages on each side of the mid-point of each transcript (7 pages of text for each group), was drawn from each transcript. The purpose of the sample was twofold: (a) to standardize the length of dialogue analyzed, and (b) to avoid the start-up and wind-down transitions in order to focus on portions of the transcript which were most likely to be on-task. The sample was coded by a single trained coder using a scheme adapted from Webb (1989). The unit of coding was the utterance, defined as a string of words communicating one idea, usually bounded by a pause of one second or more. An utterance could be as short as one word or as long as several sentences; most were very short, less than 10 words. A few speeches were split into two utterances. In all cases if the speaker changed, a new code was assigned. The coding scheme provided for two levels of coding. The first level distinguished among main communication categories (requests, responses to requests and contributions to the discussion, evaluations, off task comments, lost utterances and incomplete on-task thoughts). The second level identified subcategories for requests, responses and evaluations. Five types of requests were coded: procedures (e.g., requests for a review of the exercise directions or for equipment required by the task), evaluations (e.g., "is this right?"), facts (e.g., "what is the temperature of Krakow?"), explanations (requests calling for a detailed exposition, not just the answer to be written on the worksheet) and clarifications (requests for a repetition of what was said by another student or clarification of an ambiguous comment).

Student ability was measured in two ways. Correlational reasoning ability was assessed with an instrument that presented students with data on the age, sex and swimming speed of a sample of swimmers. Students were asked to find out if age and swimming speed were related; successful performance required that students control for the effects of a third variable, sex. The responses were coded on four dimensions (organizing data, selecting information, synthesizing and concluding) which were summed to produce a score ranging from 0 to 12. Ross & Cousins (1993) found that the instrument had high reliability (proportions of exact agreement between markers ranged from .88 to 1.0 in previous administrations) and validity. Student cognitive ability relative to other students in the class was estimated by having teachers rank each student from most to least able. Coding was inverted so that high scores represented high ranks. We selected rank in class as a proxy for ability because Webb and Kenderski (1984) found that relative ability, rather than absolute ability, had the greater impact on the relationship between student talk and academic achievement. Hoge and Coladarci (1989) found in a meta-analysis of 16 studies that teacher estimates of student ability correlated positively with scores on standardized achievement tests ($r=.66$).

A self-report instrument measuring attitudes toward seeking help from peers was administered prior to the commencement of the instructional program. The instrument was an adaptation of a questionnaire designed by Newman (1990) to measure attitudes to seeking help from the teacher. Newman conducted a principal components factor analysis, with varimax rotation, on nine items concerned with willingness to seek help, generating a three factor solution explaining 57% of the variance. The scales consisted of four items expressing willingness to seek help ($\alpha=.73$), two items referring to reasons that would seem to warrant caution in seeking

The finding for low ability students is consistent with observational studies (e.g., Nelson Le-Gall, 1987) but the reduced help seeking among upper ability students is not. Newman (1990) found that grade 3-7 student willingness to seek help was influenced by beliefs about the positive benefits of help seeking and, in the case of grade 7 students only, by beliefs about the negative consequences (such as social embarrassment). Newman and Goldin (1990) expanded on Nadler and Porat's (1978) findings concerning the social costs of help seeking. Newman and Goldin found that self-reported willingness to ask for help was reduced by fear of peer ridicule, that girls were more concerned than boys with ridicule in math and that willingness to seek help increased if students believed it would help them learn.

Studies relying upon survey methodology and/or self-report interviews have also identified factors influencing help giving that have not been investigated in observational studies. For example, Berndt (1977) found evidence of a reciprocity norm: subjects were more likely to give help if they had received it. Ladd et al. (1983) found that grade 4 students were more willing to give help if they were aware of another's need and of their own ability to provide it. Younger students (grade 1) could recognize a peer's need for help but were often unable to judge their own ability to deliver it. Other studies have found that students' knowledge of their ability to give help increases with age and that even children as young as grade 3 recognize the importance of certain helper characteristics, such as willingness and ability, on the type of help they could provide (Barnett, Darcie, Holland, & Kobasigawa, 1982; Kratzer & Nelson-Le Gall, 1990).

Triangulated Studies

Only two studies could be located that triangulated self-reports with classroom observations; both drew comparisons indirectly. In the first study (Nelson-Le Gall, 1990) the two data sets tended to converge: Girls with high mastery orientations were observed making more explicit requests for help than low mastery girls. When responding to questionnaire items high mastery girls were also more likely to react negatively to an item in which someone needed help and failed to ask for it. The second study was less clear. In Nelson-Le Gall and DeCooke (1987) grade 3 and 5 students rated the desirability of each of their classmates as potential help givers. Students were then observed soliciting assistance from peers over a six week period. Although correlations between student ratings and observed choices were not reported directly, the study did describe an incongruity. Student self-reports suggested that female classmates would be more frequently sought out as helpers than males but the observational data produced a different finding: Students were more likely to seek help from same sex peers than from opposite sex classmates.

Given that a substantial portion of what we know about student helpfulness is derived exclusively from self-reports, two studies were undertaken to examine the relationship between self-reports and observed behavior. The research was guided by the question: Will students' self-reported attitudes toward giving and seeking help predict their behavior? A cooperative learning environment was selected for the investigations because we anticipated that the frequency of helpful interactions would be higher when teacher expectations and reward interdependence supported help seeking and giving. We selected a demanding learning task (to be described below) for the same reason.

Study 1

Study 1 was a pilot investigation that focused exclusively on help seeking within a single instructional context. It was predicted that students with more positive attitudes toward help seeking would be more likely to ask for help from members of their cooperative group.

help (alpha not reported by Newman) and three items about fearing a bad grade or not remembering a component fact (alpha not reported). The eight remaining items were subjected to the same procedure (54% of the variance explained) producing two scales: three items on positive attitudes toward asking for help ($\alpha=.65$) and five items on perceived costs ($\alpha=.74$). Sixteen of Newman's items were rewritten for the present study so that the range of classroom situations, the response options (a five point scale ranging from "not likely" to "very likely" or "not true of me" to "very true of me") and the subscale structure were retained. The context was "think of a time when you were working in class and had some difficulty with the assignment" and students were asked to think in terms of asking for help from peers, rather than the teacher. There were three subscales consisting of nine items measuring willingness to seek help (e.g., "when you don't understand how to do the assignment?"), two items measuring the benefits of seeking peer help (e.g., "I think that asking other students questions helps me learn.") and five items measuring the costs of peer help seeking (e.g., "I feel shy about asking questions of other students.")

Treatment. The treatment was modelled on Student Teams Achievement Divisions (STAD) (Slavin, 1986), a cooperative learning approach that has a particularly extensive record of success (Slavin, 1990). Whole class demonstrations were used to introduce a procedure for solving two variable and multivariate correlational problems. Practice activities were undertaken in cooperative groups; these comprised about 70% of the instructional time (10 - 30 minute periods).

Students were assigned to groups using Slavin's (1986) procedure: The teacher rank ordered the class from most to least able on the basis of self-selected criteria. Students were divided into mixed ability groups so there was one high ability, one low ability and two average students in each group. Groups were adjusted to balance sexes and to eliminate delinquent alliances. Students stayed in the same groups for the duration of the treatment.

Individual and group rewards were provided. Recognition awards were given on the basis of team performance on two quizzes which were completed individually by students. For example, team certificates were given if every member of the group reached a pre-defined performance criterion. There was no direct competition between groups. Marks assigned to individual students were a combination of individual scores plus bonus marks awarded if every team member reached standards which were identified in advance.

Students were told that the purpose of the group activities was to learn how to solve correlational problems that would be assessed in two quizzes. Reward structures were explained. During each practice period students were given two exercises to work on. They were encouraged to divide themselves into pairs so that each pair worked on one exercise; the pair that finished first helped the other pair. The student task consisted of constructing scatterplots and trend lines to represent the relationship between two continuous variables, in some instances while controlling for a third variable. When both exercises were completed students compared their answers to those distributed by the teacher.

Procedure. After sample selection, the teachers were given a two hour in-service on how to teach correlational reasoning. A second two-hour in-service was given one week later on cooperative learning techniques. A rationale for cooperative learning was provided and videos were shown to demonstrate examples of successful and unsuccessful groups. Specific teaching techniques were demonstrated and key teacher decisions such as assigning students to groups, reward structures and teacher and student roles were reviewed. Data collection procedures were described.

Immediately following the in-service, teachers administered the self-report measures. The treatment was implemented over a ten day period within the next six weeks at teachers'

convenience; the video taping was done near the end of the program on the eighth or ninth day. At the end of six weeks each teacher was contacted by telephone to inquire about the teacher's implementation of the program.

The video tape transcripts and codings were entered into Text Analysis Package (TAP), a qualitative data analysis software program (Drass, 1986) that enables the tabulation of code frequencies and permits sorting. Code frequencies for each student were then integrated with the self-report data into SPSSpc system files. Correlations between self-reports and observed behaviors were calculated.

Results

The internal reliabilities of the self-report scales were adequate for intentions to seek help ($\alpha=.60$) and perceived costs of help seeking ($\alpha=.72$) but not for the two item perceived benefits scale ($\alpha=.21$).

Table 1 displays the means and standard deviations for each of the five types of requests observed in the classroom. Examination of the attitude-behavior correlations in the table shows that student intentions did not in most instances predict behavior. Those who indicated that they were willing to ask for help from their classmates were no more likely than others to do so. The only significant finding was a weak negative relationship between intention to seek help and requesting evaluations, a category of interaction that appeared relatively infrequently. Table 1 also shows that self-reported beliefs about the benefits and costs of seeking help did not predict observed behavior.

Table 1 About Here

Discussion of Study 1

Study 1 indicated that students were not able to predict their help seeking. Those who expressed an intention to ask for help were no more likely than others to do so. One possible explanation is that students did not know they needed help due to uncertainty about how well they were performing the task. In most process-product studies requesting help is negatively linked to ability, usually strongly (e.g., Ross & Raphael, 1990; Peterson, Wilkinson, Spinelli & Swing, 1984; Webb, 1984a, 1984b; Webb & Kenderski, 1984). But the frequency of requesting help was not significantly related to rank in class or to specific competence in correlational reasoning on entry to the program, except for requesting explanations ($r=-.40$, $p<.001$).

There were other possibilities that might explain the findings. The first concerns problems in instrumentation, particularly in the measurement of self-reported attitudes (Mueller, 1986; Sudman & Bradburn, 1983). The discrepancy in Study 1 may have arisen in part from: the use of a scale (perceived benefits of seeking help) with low reliability; the undetermined reliability of the coding of observed behaviors; the exclusion of portions of the tapes from coding; differences between researchers and respondents in the meaning attached to the items; and/or inadequate sampling by the survey of the behaviors to be observed. The discrepancy between self-reported attitudes and behavior might also have been attributable to characteristics of students, particularly their tendency to engage in ego-enhancing distortions in responding to self-report surveys. Interest bias, selective perception and causal attributions might each have contributed to discrepancies between self-reports and observations (D'Onofrio, 1989; Nisbett & Ross, 1980). The third possibility is that the discrepancies between attitudes and actions might have been uniquely attributable to setting characteristics. Study 1 was undertaken in classrooms implementing a particular approach to cooperative learning.

Study 2

Study 2 was based on the outcomes of Study 1 and had as its central purpose a re-examination of the relationship between self-reports and observed behavior. Problems of instrumentation were addressed by modifying the attitude scales and interviewing students to assess their understanding of the items. Procedures for determining the inter-rater reliability of the observations were introduced and some of the categories of help seeking were redefined to focus on the interactions of help seekers with help givers.

The issue of social desirability was addressed by adding help giving measures. If social desirability is a factor in reporting attitudes toward helping, it is likely to have a different effect for help seeking than for help giving. Students know, from explicit direction given by teachers, that they should assist their classmates, particularly when working in cooperative groups. There is also a generalized social responsibility norm that encourages help giving (Berkowitz & Friedman, 1967). In contrast, there is reluctance to seek help due to fear of ridicule (Newman & Goldin, 1990). Although this fear of threatening help is stimulating for higher ability students and counter-productive for the less able (DePaulo, Tang, Webb, Hoover, Marsh & Litowitz, 1989), it likely functions to inhibit self-reported help seeking for both. The result is that social desirability might depress help seeking and increase help giving in survey responses.

As another added factor Study 2 was conducted with a slightly older sample. Older students are more likely than younger ones to seek help appropriately from other students because they are more aware of their own performance and the capabilities of those around them (Aberbach & Lynch, 1991; Deering & Meloth, 1990; Nelson-Le Gall & Glor-Scheib, 1985).

The problem that the findings might be limited to a unique treatment was addressed by varying the interventions. In Study 2 one treatment replicated the STAD approach (Slavin, 1986) in which students worked in cooperative groups of four as in Study 1. In the other Study 2 treatment students worked in pairs with the help of a computer. In each case the demanding learning task introduced in Study 1 (being able to solve correlational reasoning problems) was retained.

We anticipated that the discrepancy between self-reports and observed behavior would re-emerge in Study 2 because the learning task was the same. We expected that students would not be able to predict their ability to seek and give help.

Subjects. Six grade 9/10 teachers, located in five different schools in small cities or in the rural area of east-central Ontario, volunteered for the project. Complete data sets were available for 96 students. Students were 14-16 years of age and a majority were female (58%). There were few visible minorities.

Instruments. Student interactions while in cooperative groups were audio taped on a single occasion for 20-30 minutes near the end of the program. Verbatim transcripts of the tapes were made; the students who were recorded reviewed the transcripts while listening to the audio tapes to identify speakers and correct the records of conversations.

Each transcript was coded in its entirety by a single trained coder using a scheme adapted from Study 1. There were two purposes for the revision. The first was to compress categories which could not be reliably distinguished (e.g., facts and procedures were collapsed into a single category); this also reduced the number of students with 0 instances of some of the coded behaviors. The second purpose was to tighten the relationship between request and response in order to distinguish between successful (answered) and unsuccessful (unanswered) requests.

Requests were coded as answered if the requestor received a response specifically related to the request within 10 lines of the transcript. There were three levels of requests: asking for explanations, procedures/facts or evaluations. There were five types of responses: giving procedures/facts, explanations (consisting of rationales, demonstrations and/or references to previous examples), acknowledgments (non-evaluative and content free recognition of comments from a peer), evaluations (of self, other students or the task) and giving affective support (attempts to reduce feelings of frustration by trying to make a student feel better about him/herself).

The reliability of talk coding procedures was assessed at the beginning and end of the coding by drawing a random sample of utterances which were independently coded by the Study 1 and Study 2 coders. The first comparison examined inter-rater consistency in (a) chunking the passages into codable utterances; the proportion of agreement was .93 (on 72 decisions) at the beginning of the coding and .96 (on 67 decisions) at the end of the coding. Subsequent tests measured consistency in distinguishing: (b) main codes--requests, responses and other (off task comments and audio material that could not be transcribed); the proportions of exact agreement were .93 and .91; (c) subcategories within each main code (i.e., the three types of requests, five types of responses and two types of other utterances); reliabilities were .87 and .97; and (d) answered and unanswered requests; reliabilities were 1.00 and .98.

Student attitudes toward helpfulness were measured with a self-report survey. A new item, "In general, other students are good at helping me with my school work" was added to the sixteen items used in Study 1 to make up the help seeking instrument. The help seeking items were modestly revised to create a fifteen-item help giving instrument that covered the same range of classroom situations addressed in the help seeking instrument.

Students' correlational reasoning ability on entry to the program was measured with the instrument used in Study 1. Student cognitive ability relative to other students in the class was estimated, as in Study 1, by having teachers rank each student from most to least able.

Treatment. Teachers were randomly assigned to two treatments, each containing cooperative elements. The first, hereafter the cooperative learning treatment, was modelled on STAD (Slavin, 1986). It was identical to the treatment used in Study 1 in terms of the proportion of the program in which students worked cooperatively, the procedures for assigning students to groups, the use of individual and group rewards and the rules for governing group processes.

The cooperative computer treatment (hereafter the computer treatment) was very similar except that most of the practice activities were completed by student pairs with the assistance of the computer, using the software program CORReoGRAPH.² In the computer treatment, instruction alternated between whole class demonstrations and practice tasks. The practice was completed individually using paper and pencil or by working on the computer in student pairs that were heterogeneous with regard to sex and rank in class.

Procedure. After sample selection, teachers were given a two hour in-service on how to teach correlational reasoning using the cooperative or computer approach. In each version of the in-service, specific teaching techniques were demonstrated, key teacher decisions were reviewed, a detailed instructional manual was provided and data collection procedures were described.

Immediately following the in-service teachers administered the self-report surveys and correlational reasoning tests. The treatment was implemented in the next six weeks at the teachers' convenience; the audio taping was done near the end of the program. The audio tape transcripts and codings were entered into TAP (Drass, 1986). A series of SPSSpc system files

containing frequencies of codes was created. Since the sessions varied in length, the frequencies were adjusted (by dividing by session length and multiplying by 100 to eliminate decimals). The attitude data were subjected to a principal components factor analysis with varimax rotation. The alphas of the resulting scales were calculated. Interviews were conducted in groups of four with a convenience sample of grade 7 ($N=19$) and grade 9 ($N=23$) students; these students, who were not part of the sample observed in the main study, were working in cooperative learning groups and had completed the attitude surveys two days prior to the interview. Students took turns expressing in their own words what the items in the self-report survey meant and responding to the interpretations of other students. Another convenience sample of grade 7 ($N=27$) and grade 9 ($N=25$) students completed a short questionnaire which probed the appropriateness of the attitude survey's sample of situations in which help might be sought or given.

Results

A principal components factor analysis was conducted on the help seeking self-report survey items. A scree test (Cattell, 1966) indicated that two factors ('willingness to seek help' and 'perceived cost of seeking help'), accounting for 41% of the variance, could be extracted. All the items loaded on the predicted scales at .30 or better, although two items loaded on both scales. The internal reliabilities of the scales ($\alpha=.81$ and $.79$ respectively) improved from Study 1. The same procedure was performed on the giving help attitudes scales. Two factors ('willingness to give help' and 'perceived costs of help giving'), accounting for 51% of the variance, were extracted. All the items that were expected to load on the 'give-willing' scale did so at .30 or more, although one item also loaded on the other scale. All items expected to load on the 'give-costs' scale did so at .30 or better but one item loaded on both. The internal reliability for the 'give-willing' scale was adequate ($\alpha=.89$) but for the 'give-costs' scale it was low ($\alpha=.47$), although not prohibitively so. The interviews with grade 7 and 9 students indicated that the items were interpreted in the same way by the respondents and the researchers; there were no discrepancies on any of the items. The student surveys identified a few situations that were not addressed by the items but there was only one that appeared with any frequency (19% of the sample): needing help due to absence when the class assignment was explained.

The frequencies of observed behavior were calculated separately for each treatment. Help seeking was significantly higher in the cooperative than the computer classes (the multivariate effect was $F(6,102)=2.85$, $p<.010$), as was help giving (the multivariate effect was $F(6,102)=3.66$, $p<.002$). These differences were largely attributable to the cooperative sessions being longer. When session length was controlled the differences were nonsignificant except for requests for explanation which were ignored $F(1,94)=5.56$, $p<.020$ and giving positive evaluations $F(1,94)=8.69$, $p<.004$. In each case the means were higher in the cooperative classes, perhaps because four persons generate more talk than pairs. Table 2 displays the adjusted means and standard deviations.

Table 2 About Here

Table 3 displays the correlations between self-reported and observed help seeking. For the cooperative group, all but one of the correlations were nonsignificant. The exception was in the expected direction: students who indicated that they were more aware of the costs of seeking help from their peers were less likely to ask for it. For the computer group, ten of the twelve correlations were nonsignificant. The exceptions were counter-intuitive: those who expressed a greater willingness to seek help were observed to do so less frequently than other members of the sample. As in Study 1, students who were most likely to need help did not seek it; the correlations (not shown) were near zero between observed help-seeking behavior and the two ability measures (rank in class and correlational reasoning scores on entry to the program). The only significant

correlation indicated that lower ability students were more likely to make requests for explanations that were ignored in the cooperative treatment ($r=.28$, $N=45$, $p<.030$).

Table 3 About Here

Table 4 presents the correlations for help giving. For the cooperative group there were only four significant correlations. These were in the expected direction: students who expressed a greater willingness to give help were more likely to provide it and those who were more aware of the costs of help giving were less likely to give it. For the computer group there was only one significant correlation; contrary to expectation, students who reported a greater willingness to give help were less likely to acknowledge the contributions of others. The correlations between observed help giving and rank in class were almost all near zero. When the scores on the correlational reasoning task were considered, the expected pattern between ability and help giving became more visible for the cooperative treatment, although the relationship continued to be weak. Students who were more successful on the cognitive achievement instrument were more likely to give facts/procedures ($r=.25$, $p<.049$, $N=45$) and affective support ($r=.30$, $p<.024$, $N=45$).

Table 4 About Here

Discussion of Study 2

In most instances the self-reports did not predict observed behavior. But why did students not act out their intentions?

The first possibility is that students were not able to assess their own competence. The low correlations of observed behavior with the ability measures indicate that those with a greater need for help were no more likely than others to seek it and those with greater capacity to help were no more likely to give it. Students were engaged in solving correlational reasoning problems, a domain in which students perform poorly (Cousins & Ross, in press-b; Ross & Cousins, 1993, in press-a; Lawson & Bealer, 1984; Yap & Yeany, 1988). The pretest may have appeared easy to the less able, in that the task of relating swimming speed to age involved familiar content, thereby inappropriately elevating self-appraisals and impeding some students from recognizing that they needed to get help. In contrast the more able may have realized that despite its surface content the task was one for which they were ill-prepared. Such a perception might have depressed feelings of confidence in their ability to help others. These feelings may have continued into the program because students received no direct feedback on how they had done on the pretest. During the program students did receive feedback in the form of correct graphs which could be used by the students as models to evaluate their own graphs. But these models may not have reduced uncertainty about competence since representations of equivalent relationships could vary considerably, depending upon such factors as the scales used for the variables. Those who reported themselves willing to seek help may not have done so to the extent they anticipated because uncertainty about competence hindered recognition of the need and reduced their ability to identify those who might have been able to provide appropriate help.

A second explanation for the discrepancy between self-reports and behavior might be related to the procedure that was used to assign students to groups. These students were used to working in friendship groups; when they completed the surveys they reported their intentions to seek and give help to familiars. But they were observed when working in heterogeneous groups. Assigning students to mixed-ability, mixed-sex pairs or groups may have depressed help seeking because students are more likely to seek help from familiars (Amato & Saunders, 1985; DeCooke & Nelson-Le Gall, 1989; DePaulo, 1979; Nelson-Le Gall & Gumerman, 1984), particularly members of the same rather than the opposite sex (Huston, Carpenter, Atwater, & Johnson, 1986; Ladd et al., 1983; Nelson-Le Gall & DeCooke, 1987), and they are more likely to help if a

reciprocal pattern of helping has been established (Berkowitz & Friedman, 1967). Initial unfamiliarity with partners in the group/pair assignments was particularly important given the relatively short duration of the treatment. Students did not have time to learn about each other's needs and abilities in order to develop cohesive working relationships. Ross & Raphael (1990), for example, found that student interactions in cooperative groups change over several weeks of observation. Lack of familiarity had the effect of reinforcing the problem of uncertainty. Help givers could not rely upon their past working experience with members of their group to predict who was likely to need help; by the same token, help seekers lacked prior knowledge to determine which group members would be willing and able to help them.

Study 2 also addressed counter explanations for the discrepancy between self-reports and behavior. The first was inadequate measurement by the self-reports, the observations or both. The reliability of both sets of instruments was adequate, although the evidence was more persuasive for the observations. Since correlations are much more likely to be distorted when single acts are compared, the observation instrument examined a series of behaviors and the surveys compiled scales from a cluster of situations. The items used in the surveys corresponded to experiences familiar to students and their interpretations of the language used were compatible with those of the researchers. Both instruments were written at the same level of generality. The survey asked students to report their intentions to seek and give help from a peer (as opposed to some other person) while working in class (as opposed to elsewhere) with other students (as opposed to independent seat work) and these were the conditions under which they were observed. One instrument factor that may have created some distortion was the observation of students on a single occasion. There was qualitative evidence in both studies (whisperings that were picked up by the sensitive microphones) that some students were inhibited by the recording and were more reticent than they would otherwise be. This likely depressed the means but in the absence of some larger theory linking sensitivity to observation to willingness to seek and give help, it is not obvious that the correlations with self-reports were affected.

The second alternative explanation was social desirability distortions of self-reports. Study 2 examined the relationship between self-reports and observed behavior in two conditions: when self-reported frequencies may have been depressed (help seeking) or exaggerated (help giving) by social desirability. In each case the results were the same. But social desirability was not explicitly measured and the hypothesis that it contributes to the failure of self-reports to predict behavior remains untested.

Finally, Study 2 investigated the possibility that the discrepancy between self-reports and behavior was attributable to a unique treatment. The relationship was virtually the same when students were working in pairs with a computer as when they were working in four person groups with pencil and paper.

Conclusions

Studies 1 and 2 provide little evidence to suggest that those who express an intention to seek and give help actually do so. These findings, together with the results from another study (Nelson-Le Gall & DeCooke, 1987) that found an incongruence between self-reported help seeking and observed behavior, could be interpreted as evidence that measuring helpfulness via self-reports is problematic. From the standpoint of measurement theory, self-reports reveal dispositions to act in hypothetical situations rather than real actions in concrete circumstances: "if an attitude measure does not predict behavior, it is, by definition, not valid" (Mueller, 1986: 69). One might conclude from this perspective that findings about student helpfulness derived exclusively from self-reports are in jeopardy: such findings should be treated with caution until they are replicated with observational studies.

Social learning theory provides a different interpretation for the results. From this perspective, student talk is constructive if it stimulates conceptual conflict. Conflict is represented as a learning process in which students' articulate, defend and restructure their conceptions about the domain to be learned (Doise & Hanselmann, 1991; Doise & Mugny, 1979; Forman, 1989). But the peer learning dynamic may have been flawed in the correlational reasoning treatments. When we compared the cooperative and computer treatments of Study 2 to a similar treatment in which students worked individually, we found that working together had no greater impact on student achievement than working alone (Cousins & Ross, in press-a). We suggest that the benefits of peer learning did not accrue because of student uncertainty about their proficiency in solving correlational problems. Tudge (1989, 1990) found that students' uncertainty about their competence (in his case predicting the outcome of a balance beam task) had a negative effect on learning from peers. Tudge reported that students using a decision rule that led to uncertainty deferred to those who used a rule that produced certainty, even when the latter rule was less advanced than their own: some students regressed in performance during the peer interaction. The social learning perspective suggests that the self-reports may have accurately characterized student intentions even as the observations accurately described their actions. The discrepancy arose when students' willingness to give and seek help was distorted by difficulties in determining their own competence and that of their peers. Lack of familiarity with other members of their group further hampered implementation of their intentions.

The measurement theory and the social learning interpretations of the findings from Study 1 and Study 2 could be explored in a investigation in which self-reports are compared to observations under four conditions. The first set of conditions could be the assignment of students to work in cooperative groups on (a) tasks in which there is uncertainty about correct performance (e.g., correlational reasoning, interpretation of poetry, analysis of social issues) and (b) tasks in which students can be expected to appraise the performance of themselves and their peers accurately (e.g., reading for information, algorithmic tasks). We predict, from the discussion of the impact of uncertainty on social learning, that the correlations between self-reports and observations would be higher in the latter than in the former. The second set of conditions could consist of self-reported student intentions (a) before the implementation of the learning task in response to items about seeking and giving help in hypothetical classroom situations and (b) after implementation, in response to items about the specific group tasks to which they were assigned. From measurement theory we predict that the correlations between self-reports and observations would be higher in the latter than the former. We further predict that the two factors would have an additive effect.

REFERENCES

- Aberbach, A., & Lynch, S. (1991). *When getting help is helpful: Gender and grade differences in children's autonomous help-seeking*. Paper presented at the annual meeting of the American Educational Research Association, Chicago.
- Aberbach, A., Lynch, S., & Eccles, J. (1991). *Factors influencing children's help-seeking styles*. Paper presented at the annual meeting of the American Educational Research Association, Chicago.
- Amato, P. & Saunders, J. (1985). The perceived dimensions of help-seeking episodes. *Social Psychology Quarterly*, 48 (2), 130-138.
- Barnett, K., Darcie, G., Holland, C., & Kobasigawa, A. (1982). Children's cognitions about effective helping. *Developmental Psychology*, 18, 267-277.
- Berkowitz, L., & Friedman, P. (1967). Some social class distinctions in helping behavior. *Journal of Personality and Social Psychology*, 5 (2), 217-225.
- Berndt, T. (1977). The effect of reciprocity norms on moral judgments and causal attributions. *Child Development*, 48, 1322-1330.
- Broll, L., Gross, A., Piliavin, I. (1974). Effects of offered and requested help on help seeking and reactions to being helped. *Journal of Applied Social Psychology*, 4 (3), 244-258.
- Cattell, R. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, 1, 245-276.
- Cooper, C., Marquis, A. & Ayers-Lopez, S. (1982). Peer learning in the classroom: Tracing developmental patterns and consequences of children's spontaneous interactions. In L. Adler, *Cross cultural research at issue*, pp.69-84. New York: Academic Press.
- Corno, L., & Mandinach, E. (1983). The role of cognitive engagement in classroom learning and motivation. *Educational Psychologist*, 18 (2), 88-108.
- Cousins, J. B., & Ross, J. (in press a). Improving higher order thinking skills "with" the computer: A comparative study. *Journal of Research on Computing in Education*
- deCooke, P., & Nelson-Le Gall, S. (1989). The effects of familiarity on the success of children's help seeking. *Journal of Applied Developmental Psychology*, 10, 195-208.
- Deering, P., & Meloth, M. (1990). *An analysis of the content and form of students' verbal interactions in cooperative groups*. Paper presented at the annual meeting of the American Educational Research Association, Boston.
- Dembo, M., & McAuliffe, T. (1987). Effects of perceived ability and grade status on social interaction and influence in cooperative groups. *Journal of Educational Psychology*, 79 (4), 415-423.
- dePaulo, B. (1979). Help seeking from the recipient's point of view. *JSAS Catalogue of Selected Documents in Psychology*, 8, 62.

- dePaulo, B., Tang, J., Webb, W., Hoover, C., Marsh, K. & Litowitz, C. (1989). Age differences in reactions to help in a peer tutoring context. *Child Development*, 60 (2), 423-439.
- Doise, W., & Hanselmann, C. (1991). Conflict and social marking in the acquisition of operational thinking. *Learning and Instruction*, 1, 119-127.
- Doise, W., & Mugny, G. (1979). Individual and collective conflicts of centrations in cognitive development. *European Journal of Social Psychology*, 9, 105-108.
- D'Onofrio, C. (1989). The use of self-reports on sensitive behaviors in health program evaluation. In M. Braverman (Ed.), *Evaluating health programs* (pp. 59-74). New Directions for Program Evaluation, No. 43, San Francisco, CA: Jossey-Bass.
- Drass, K. (1986). *TAP 1.0: Text analysis package*. Mimeo. Dallas, TX.
- Eisenberg-Berg, N., & Hand, M. (1979). The relationship of preschoolers' reasoning about prosocial moral conflicts to prosocial behavior. *Child Development*, 50, 356-363.
- Fischer, E., & Turner, J. (1970). Orientations to seeking professional help: Development and research utility of an attitude scale. *Journal of Consulting and Clinical Psychology*, 35 (1), 79-90.
- Forman, E. (1989). The role of peer interaction in the social construction of mathematical knowledge. *International Journal of Educational Research*, 13 (1), 55-70.
- Good, T., Slavings, R., Harel, K., & Emerson, H. (1981). Student passivity: A study of question asking in K-12 classrooms. *Sociology of Education*, 60, 181-199.
- Hogaboam-Gray, A., Ross, J., & Cousins, J. B. (1991). CORReoGRAPH--A program for solving correlational reasoning problems: User's guide. Peterborough, ON: OISE Trent Valley Centre.
- Hoge, R., & Coladarci, T. (1989). Teacher based judgments of academic achievement: A review of literature. *Review of Educational Research*, 59 (3), 297-313.
- Hook, C., & Rosenshine, B. (1979). Accuracy of teacher reports of their classroom behavior. *Review of Educational Research*, 49, 1-12.
- Huston, A., Carpenter, C., Atwater, J., & Johnson, L. (1986). Gender adult structuring of activities and social behavior in middle childhood. *Child Development*, 57, 1200-1209.
- Johnson, D., Maruyama, G., Johnson, R., Nelson, D., & Skon, L. (1981). Effects of cooperative, competitive, and individualistic goal structures on achievement: A meta-analysis. *Psychological Bulletin*, 89 (1) 47-62.
- Karenbenick, S., & Knapp, J. (1988). Help seeking and the need for academic assistance. *Journal of Educational Psychology*, 80 (3), 406-408.
- Kratzer, L., & Nelson-Le Gall, S. (1990). Understanding the competencies and limitations of wheelchair-bound peers as helper: Developmental changes in early childhood. *Journal of Applied Developmental Psychology*, 11, 69-85.

- Ladd, G. W., Lange, G., & Stremmel, A. (1983). Personal and situational influences on children's helping behavior: Factors that mediate compliant helping. *Child Development*, 54, 488-501.
- Lawson, A., & Bealer, J. (1984). The acquisition of basic quantitative reasoning skills during adolescence: Learning or development. *Journal of Research in Science Teaching*, 21 (4), 417-423.
- Lindlow, J. A., Wilkinson, L. C. & Peterson, P.L. (1985). Antecedents and consequences of verbal disagreements during small-group learning. *Journal of Educational Psychology*, 77 (6), 658-667.
- Markman, E. (1977). Realizing that you don't understand: A preliminary investigation. *Child Development*, 48, 986-992.
- Morse, S., Gergen, K., Peele, S., & van Ryneveld, J. (1977). Reactions to receiving expected and unexpected help from a person who violates or does not violate a norm. *Journal of Experimental Social Psychology*, 13, 397-402.
- Mueller, D. (1986). *Measuring social attitudes: A handbook for researchers and practitioners*. New York, NY: Teachers College Press.
- Nadler, A., & Porat, I. (1978). When names do not help: Effects of anonymity and locus of need attribution on help seeking behavior. *Personality and Social Psychology Bulletin*, 4 (4), 624-626.
- Nelson-Le Gall, S. (1985). Help-seeking in learning. In E. Gordon (Ed.), *Review of research in education* (Vol. 12, pp. 55-90). Washington, DC: American Educational Research Association.
- Nelson-Le Gall, S. (1987). Necessary and unnecessary help-seeking in children. *Journal of Genetic Psychology*, 148 (1), 53-62.
- Nelson-Le Gall, S., & DeCooke, P. (1987). Same-sex and cross-sex help exchanges in the classroom. *Journal of Educational Psychology*, 79 (1) 67-71.
- Nelson-Le Gall, S., DeCooke, P., & Jones, E. (1989). Children's self-perceptions of competence and help seeking. *Journal of Genetic Psychology*, 150 (4), 457-459.
- Nelson-Le Gall, S., & Glor-Scheib, S. (1985). Help seeking in elementary classrooms: An observational study. *Contemporary Educational Psychology*, 10, 58-71.
- Nelson-Le Gall, S. & Glor-Scheib, S. (1986). Academic help-seeking and peer relations in school. *Contemporary Educational Psychology*, 11, 187-193.
- Nelson-Le Gall, S., & Gumerman, R. (1984). Children's perceptions of helpers and helper motivation. *Journal of Applied Developmental Psychology*, 5, 1-12.
- Nelson-Le Gall, S., & Jones, E. (1990). Cognitive-motivational influences on the task-related help-seeking behavior of black children. *Child Development*, 61, 581-589.

- Nelson-Le Gall, S., Kratzer, L., Jones, E., & DeCooke, P. (1990). Children's self-assessment of performance and task-related help seeking. *Journal of Experimental Child Psychology*, 49, 245-263.
- Nemeth, C. (1970). Effects of free versus constrained behavior on attraction between people. *Journal of Personality and Social Psychology*, 15 (4), 302-311.
- Newman, R. (1990). Children's help-seeking in the classroom: The role of motivational factors and attitudes. *Journal of Educational Psychology*, 82 (1), 71-80.
- Newman, R., & Goldin, L. (1990). Children's reluctance to seek help with schoolwork. *Journal of Educational Psychology*, 82 (1), 92-100.
- Nisbett, R., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment*. Englewood Cliffs, NJ: Prentice-Hall.
- Northman, J. (1978). Development change in preference for today. *Journal of Clinical Child Psychology*, 7 (2), 129-132.
- Petersen, R., Johnson, D., & Johnson, R. (1991). Effects of cooperative learning on perceived status of male and female pupils. *Journal of Social Psychology*, 131 (5), 717-735.
- Peterson, P. & Janicki, T. (1979). Individual characteristics and children's learning in large-group and small-group approaches. *Journal of Educational Psychology*, 71 (5), 677-687.
- Peterson, P., Wilkinson, L., Spinelli, F., & Swing, S. (1984). Merging the process-product and the sociolinguistic paradigms: Research on small group processes. In P. Peterson, L. Wilkinson, & M. Hallinan (Eds.), *The social context of instruction: Group organization and group processes* (pp. 125-153). New York, NY: Academic.
- Ross, J. & Cousins, J. B. (in press b). Enhancing secondary school students' acquisition of correlational reasoning skills. *Research in Science & Technological Education*.
- Ross, J., & Cousins, J. B. (1993). Patterns of student growth in reasoning about multivariate correlational problems. *Journal of Educational Psychology*, 85 (1), 1-17.
- Ross, J., & Cousins, J. B. (1992). *The development of correlational reasoning: The effect of alternate instructional strategies*. Final report to the Social Sciences and Humanities Research Council of Canada. Peterborough, Ont: OISE Trent Valley Centre.
- Ross, J., & Raphael, D. (1990). Communication and problem solving achievement in cooperative learning groups. *Journal of Curriculum Studies*, 22 (2), 149-164.
- Saunders, W. (1989). Collaborative writing tasks and peer interaction. *International Journal of Educational Research*, 13 (1), 101-112.
- Slavin, R. (1986). Student team learning: The basic techniques. In R. Slavin, *Using student team learning*. Baltimore: Johns Hopkins.
- Slavin, R. (1990). *Cooperative learning: Theory, research, and practice*. Englewood Cliffs, NJ: Prentice Hall.

- Sudman, S., & Bradburn, N. (1983). *Asking questions: A practical guide to questionnaire design*. San Francisco, CA: Jossey-Bass.
- Swing, S., & Peterson, P. (1982). The relationship of student ability and small-group interaction to student achievement. *American Educational Research Journal*, 19 (2), 259-274.
- Tudge, J. (1989). When collaboration leads to regression: Some negative consequences of socio-cognitive conflict. *European Journal of Social Psychology*, 19, 123-189.
- Tudge, J. (1990). Collaborative problem solving in the zone of proximal development. Paper presented at the annual meeting of the American Educational Research Association, Boston.
- Wallston, B. (1976). The effects of sex-role ideology, self-esteem, and expected future interactions with an audience on male help seeking. *Sex Roles*, 2 (4), 353-365.
- Webb, N. (1984a). Microcomputer learning in small groups: Cognitive requirements and group processes. *Journal of Educational Psychology*, 76 (6), 1076-1088.
- Webb, N. (1984b). Sex differences in interaction and achievement in cooperative small groups. *Journal of Educational Psychology*, 76 (1), 33-44.
- Webb, N. (1989). Peer interaction and learning in small groups. *International Journal of Educational Research*, 13 (1), 21-39.
- Webb, N., Ender, P., & Lewis, S. (1986). Problem-solving strategies and group processes in small groups learning computer programming. *American Educational Research Journal*, 23 (2), 243-261.
- Webb, N., & Kenderski, C. (1984). Student interaction and learning in small group and whole class settings. In P. Peterson, L. Wilkinson, & M. Hallinan (Eds.), *The social context of instruction: Group organization and group processes* (pp. 153-170). New York, NY: Academic.
- Webb, N., Qi, S., Yan, K., Bushey, B., & Farivar, S. (1990). *Cooperative small-group problem solving in middle school mathematics*. Paper presented at the American Educational Research Association, Boston.
- Wilkinson, L., & Calculator, S. (1982). Effective speakers: Students' use of language to request and obtain information and action in the classroom. In L. Wilkinson (Ed). *Communicating in the Classroom*, pp. 85-99. New York, NY: Academic.
- Wilkinson, L. C. & Spinelli, F. (1983). Using requests effectively in peer-directed instructional groups. *American Educational Research Journal*, 20 (4), 479-501.
- Wubbels, T., Brekelmans, M., & Hooymayers, H. (1992). Do teacher ideals distort the self-reports of their interpersonal behavior. *Teaching and Teacher Education*, 8 (1), 47-58.
- Yap, K., & Yeany, R. (1988). Validation of hierarchical relationships among Piagetian cognitive modes and integrated science process skills for different cognitive reasoning levels. *Journal of Research in Science Teaching*, 25 (4), 247-281.

FOOTNOTES

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²The software program was designed to support the correlational reasoning instruction package (Hogaboam-Gray, Ross & Cousins, 1991). In addition to procedures for file management, the program provided simple commands to create multivariate scatterplots and calculate correlation coefficients.

Table 1

Means and Standard Deviations of Observed Requests for Help, and Correlations with Self-Reported Intentions, Study 1 (N = 58)

Requests	Mean	Standard Deviation	Correlation with Self-Reports		
			Intention to Seek Help	Benefits of Help Seeking	Costs of Help Seeking
Procedure	1.86	2.13	-.03	.15	.11
Evaluation	0.74	1.04	-.24*	-.01	.02
Fact	1.31	1.47	-.13	.20	.05
Explanation	0.75	1.19	-.04	-.06	-.16
Clarification	1.18	1.39	-.06	.05	.10

* $p < .05$.

Table 2

Adjusted Mean Frequencies of Occurrences (and Standard Deviations) for Observed Help Seeking and Help Giving by Treatment, Study 2

Category	Means & Standard Deviations	
	Cooperative (N=45)	Computer (N=51)
Requesting Help		
facts/procedures, answered	2.66 (1.82)	2.40 (2.04)
facts/procedures, ignored	0.88 (0.87)	0.85 (0.77)
evaluations, answered	0.56 (0.74)	0.36 (0.68)
evaluations, ignored	0.35 (0.56)	0.14 (0.29)*
explanations, answered	0.14 (0.22)	0.09 (0.27)
explanations, ignored	0.04 (0.13)	0.07 (0.21)
Giving Help		
facts/procedures	8.77 (5.44)	7.95 (4.79)
explanations	0.10 (0.27)	0.02 (0.29)
comfort	0.03 (0.12)	0.00 (0.00)
acknowledgements	2.59 (2.36)	2.02 (1.59)
positive evaluations	2.65 (1.63)	1.71 (1.50)**
negative evaluations	1.90 (1.62)	1.80 (1.52)

* $p < .05$. ** $p < .01$.

Table 3

Correlations of Observed Requests for Help (Mean Frequencies Adjusted by Session Duration) with Self-Reports by Treatment Group, Study 2

	Cooperative ($N = 42-44$)		Computer ($N = 46-51$)	
	seek-willing	seek-cost	seek-willing	seek-cost
Answered Requests				
facts & procedures	.14	-.14	-.27*	-.03
evaluations	-.14	-.29*	-.27*	-.03
explanations	-.09	.16	-.11	-.14
Ignored Requests				
facts & procedures	-.23	-.18	-.19	-.11
evaluations	-.16	-.21	-.06	-.07
explanations	.06	-.09	-.07	-.21

* $p < .05$.

Table 4

Correlations of Observed Help Giving Help (Mean Frequencies Adjusted by Session Duration) with Self-Reports by Treatment Group, Study 2

	Cooperative (<u>N</u> = 42-44)		Computer (<u>N</u> = 46-51)	
	give-willing	give-costs	give-willing	give-costs
Giving Help Codes				
.facts & procedures	-.08	-.31*	.07	.01
.explanations	.15	-.01	-.06	-.17
.comfort	.11	-.13	NA	NA
.acknowledgements	.28*	-.15	-.27*	.01
.positive evaluations	-.02	-.33*	.03	-.13
.negative evaluations	-.01	-.43**	-.15	.08

* $p < .05$. ** $p < .01$.

NA=zero occurrences of the behavior